



General

Guideline Title

Platelet transfusion: a clinical practice guideline from the AABB.

Bibliographic Source(s)

Kaufman RM, Djulbegovic B, Gernsheimer T, Kleinman S, Timmouth AT, Capocelli KE, Cipolle MD, Cohn CS, Fung MK, Grossman BJ, Mintz PD, O'Malley BA, Sesok-Pizzini DA, Shander A, Stack GE, Weibert KE, Weinstein R, Welch BG, Whitman GJ, Wong EC, Tobian AA, AABB. Platelet transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2015 Feb 3;162(3):205-13. [73 references]
[PubMed](#)

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Quality of evidence grades (high, moderate, low, very low) and strength of recommendations (strong, weak, uncertain) are defined at the end of the "Major Recommendations" field.

Clinical Setting 1: Hospitalized Adult Patients with Therapy-Induced Hypoproliferative Thrombocytopenia

Recommendation 1

The AABB recommends that platelets should be transfused prophylactically to reduce the risk for spontaneous bleeding in adult patients with therapy-induced hypoproliferative thrombocytopenia.

The AABB recommends transfusing hospitalized adult patients with a platelet count of 10×10^9 cells/L or less to reduce the risk for spontaneous bleeding.

The AABB recommends transfusing up to a single apheresis unit or equivalent. Greater doses are not more effective, and lower doses equal to one half of a standard apheresis unit are equally effective.

Quality of evidence: moderate; strength of recommendation: strong

Clinical Setting 2: Adult Patients Having Minor Invasive Procedures

Recommendation 2

The AABB suggests prophylactic platelet transfusion for patients having elective central venous catheter placement with a platelet count less than 20×10^9 cells/L.

Quality of evidence: low; strength of recommendation: weak

Recommendation 3

The AABB suggests prophylactic platelet transfusion for patients having elective diagnostic lumbar puncture with a platelet count less than 50×10^9 cells/L.

Quality of evidence: very low; strength of recommendation: weak

Clinical Setting 3: Adult Patients Having Major Elective Nonneuraxial Surgery

Recommendation 4

The AABB suggests prophylactic platelet transfusion for patients having major elective nonneuraxial surgery with a platelet count less than 50×10^9 cells/L.

Quality of evidence: very low; strength of recommendation: weak

Recommendation 5

The AABB recommends against routine prophylactic platelet transfusion for patients who are nonthrombocytopenic and have cardiac surgery with cardiopulmonary bypass (CPB). The AABB suggests platelet transfusion for patients having CPB who exhibit perioperative bleeding with thrombocytopenia and/or with evidence of platelet dysfunction.

Quality of evidence: very low; strength of recommendation: weak

Clinical Setting 4: Adult Patients Receiving Antiplatelet Therapy Who Have Intracranial Hemorrhage (Traumatic or Spontaneous)

Recommendation 6

The AABB cannot recommend for or against platelet transfusion for patients receiving antiplatelet therapy who have intracranial hemorrhage (traumatic or spontaneous).

Quality of evidence: very low; strength of recommendation: uncertain

Definitions

Grading of Recommendations Assessment, Development and Evaluation (GRADE) Quality of Evidence

Grade	Definition
High	Further research is very unlikely to change confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
Low	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very Low	Any estimate of effect is very uncertain.

Strength of Recommendations

The strength of recommendations (for or against intervention) is graded as "strong" (indicating judgment that most well-informed people will make the same choice; "The AABB recommends . . ."), "weak" (indicating judgment that a majority of well-informed people will make the same choice, but a substantial minority will not; "The AABB suggests . . ."), or "uncertain" (indicating that the panel made no specific recommendation for or against interventions; "The AABB" cannot recommend . . .").

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Thrombocytopenia and other conditions requiring platelet transfusion to reduce risk of bleeding

Guideline Category

Management

Prevention

Clinical Specialty

Cardiology

Hematology

Internal Medicine

Neurological Surgery

Oncology

Surgery

Thoracic Surgery

Intended Users

Advanced Practice Nurses

Hospitals

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To provide pragmatic recommendations, based on the best available published evidence, about when platelet transfusion may be appropriate in adult patients
- To identify a platelet count threshold below which platelet transfusion may improve hemostasis and above which platelet transfusion is unlikely to benefit the patient for several common clinical situations

Target Population

Adult patients who are candidates for platelet transfusion in the following clinical settings:

- Hospitalized patients with therapy-induced hypoproliferative thrombocytopenia
- Patients having minor invasive procedures
- Patient having major elective nonneuraxial surgery
- Patients receiving antiplatelet therapy who have intracranial hemorrhage

Interventions and Practices Considered

1. Prophylactic platelet transfusion (apheresis or whole blood–derived [buffy coat or platelet-rich plasma] platelet concentrates)
2. Platelet count threshold

Major Outcomes Considered

- All-cause mortality
- Mortality due to bleeding
- Bleeding ("major" or "significant" bleeding as defined in each study)
- Number of platelet transfusions

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Criteria for Considering Studies for the Review

Types of Studies

Randomized controlled trials (RCTs) and observational studies (prospective or retrospective cohort studies, case-control studies, and those with no control arm) were eligible for inclusion. Although all observational studies meeting the inclusion criteria were reviewed, data from these studies were not used when more than two RCTs addressed a particular question. The use of evidence summaries based only on RCTs was favored due to confounding-by-indication bias in observational transfusion studies: that is, platelet transfusion is often administered based on disease severity.

Types of Participants

Patients undergoing platelet transfusions in RCTs or observational studies were eligible for inclusion.

Types of Interventions

Apheresis or whole blood–derived (buffy coat or platelet-rich plasma) platelet concentrates whether used as therapeutic or prophylactic interventions for any clinical condition were eligible for inclusion. The comparison group (if any) was a medical management strategy without platelet transfusion or, in the case of the platelet dosing or platelet count threshold question, platelet transfusion strategy using a different dose or threshold.

Types of Outcome Measures

Outcome measures considered were all-cause mortality, mortality due to bleeding, bleeding ("major" or "significant" bleeding as defined in each study), and number of platelet transfusions.

Search Methods for Identification of Studies

The reviewers searched the Cochrane CENTRAL, PubMed, and Web of Science databases since inception until September 5, 2014. There was no restriction on eligibility criteria in terms of when the studies were performed or language. They first searched for existing guidelines/systematic reviews using the search filter developed by Haynes and colleagues. References of obtained articles from identified guidelines and systematic reviews were manually scanned to identify other potentially relevant articles for inclusion in the review. Members of the AABB Guidelines Panel were also canvassed to identify potentially eligible unpublished or ongoing studies. When deemed necessary, study authors were contacted for information not available or not well described in the original papers.

See the Appendix S1 in the systematic review supporting information (see the "Availability of Companion Documents" field) and Appendix Table 2 in the original guideline document for a full search strategy.

Selection of Studies

All titles, abstracts, and full-text reports were reviewed by two authors of the systematic review; further review was conducted by a third author when there was disagreement about eligibility of the study for inclusion in the review.

Number of Source Documents

Of 1594 citations, 17 randomized controlled trials (RCTs) and 55 observational studies were included in the final systematic review.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Grading of Recommendations Assessment, Development and Evaluation (GRADE) Quality of Evidence

Grade	Definition
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Very Low	Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Data Extraction

Data extraction forms were piloted. The final forms were used to extract data in duplicate, and a further review for accuracy was conducted by an independent member of the panel.

Assessment of Risk of Bias in Included Studies

Assessment of the risk of bias in the included randomized controlled trials (RCTs) was done according to The Cochrane Collaboration's tool for

assessing the risk of bias. The risk of bias in observational studies was assessed using the Newcastle Ottawa Scale, supplemented by the guidance paper by Wells and coworkers. Overall quality of the studies was categorized in four categories according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) method (details on GRADE method are provided in Appendix S2, available as supporting information in the online version of this guideline). A formal assessment of publication bias was not performed, since a small number of studies (<10) will typically generate false-negative results.

Measures of Treatment Effect

Dichotomous data were summarized using odds ratio (OR) and pooled data using the random-effects model along with 95% confidence intervals (CIs) for cohort and RCT studies. Continuous data were summarized using mean difference or standardized mean difference and reported with 95% CI for both prospective and retrospective studies. Some prespecified subgroup analyses were conducted, but others could not be conducted due to the limited amount of available data.

Assessment of Heterogeneity

To evaluate heterogeneity between pooled studies, the I^2 statistic was calculated. The reviewers planned to assess potential sources of heterogeneity by conducting a sensitivity analysis on all aspects of study quality, but the number of studies was too small to allow reliable statistical analysis. Clinical heterogeneity was also assessed according to the PICO (patient, intervention, comparator, and outcome) format. Based on this assessment, the reviewers were generally able to pool data from individual RCTs. For observational studies, data were pooled based on the consensus of three research team members followed by concurrence of the entire panel. RCT data with observational study data were not pooled. Meta-analysis was performed using Review Manager 5 (RevMan 2011, <http://tech.cochrane.org/revman>). A GRADE evidence profile was constructed for all outcomes. Where meta-analysis was not possible, evidence was summarized descriptively.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Development of Clinical Questions

Clinical questions were developed by an AABB Guidelines Panel consisting of 21 members. The panel was charged with providing direction for development of the systematic review (see the "Availability of Companion Documents" field), which in turn was used to inform the development of clinical practice guidelines (reported in a separate document). This systematic review was performed according to the standards of The Cochrane Collaboration, using a standardized protocol and reported as per the PRISMA guidelines.

Panel Composition

A panel of 21 experts was convened. Fifteen participants were members of the Clinical Transfusion Medicine Committee of the AABB, all of whom were hematologists or pathologists with expertise in transfusion medicine. Five additional panel members included a neurosurgeon, a cardiac surgeon, a critical care specialist, an anesthesiologist, and a hematologist, representing the American Association of Neurological Surgeons, the Society of Thoracic Surgeons, the Society of Critical Care Medicine, the American Society of Anesthesiologists, and the American Society of Hematology, respectively. The final panel member was a Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodologist.

Grading of Evidence

The GRADE method was used to assess the quality of the evidence and determine the strength of recommendations. The recommendations were developed by consensus at an in-person panel meeting. Panel member judgments on 4 GRADE factors (quality of evidence, balance between the intervention's benefits and harms, resource use, and patient values and preferences) and ratings of the strength of recommendations were validated using an online survey tool 1 week after the meeting.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

The strength of recommendations (for or against intervention) is graded as "strong" (indicating judgment that most well-informed people will make the same choice; "The AABB recommends. . ."), "weak" (indicating judgment that a majority of well-informed people will make the same choice, but a substantial minority will not; "The AABB suggests . . ."), or "uncertain" (indicating that the panel made no specific recommendation for or against interventions; "The AABB" cannot recommend . . .").

Cost Analysis

A cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

Description of Method of Guideline Validation

Recommendations from the Society of Thoracic Surgeons and the Society of Interventional Radiology were discussed. See the "Comparison with Other Published Guidelines" section in the original guideline document for a comparison of recommendations.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate use of platelet transfusion in adults

Potential Harms

Platelet transfusion is associated with several risks to the recipient, including allergic reactions and febrile nonhemolytic reactions, bacterial sepsis, transfusion-related acute lung injury, hepatitis B infection, hepatitis C infection, and human immunodeficiency virus (HIV) infection. Sepsis from a bacterially contaminated platelet unit represents the most frequent infectious complication from any blood product today. In any situation where platelet transfusion is being considered, these risks must be balanced against the potential clinical benefits.

Qualifying Statements

Qualifying Statements

The guideline developers did not attempt to address all clinical situations in which platelets may be transfused, and these guidelines are not intended to serve as standards. Clinical judgment, and not a specific platelet count threshold, is paramount in deciding whether to transfuse platelets.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

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[PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015 Feb 3

Guideline Developer(s)

AABB - Nonprofit Organization

Source(s) of Funding

The AABB commissioned and funded the development of these guidelines.

Guideline Committee

Expert Panel

Composition of Group That Authored the Guideline

Expert Panel Members: Richard M. Kaufman, MD; Benjamin Djulbegovic, MD, PhD; Terry Gernsheimer, MD; Steven Kleinman, MD; Alan T. Timmuth, MD; Kelley E. Capocelli, MD; Mark D. Cipolle, MD, PhD; Claudia S. Cohn, MD, PhD; Mark K. Fung, MD, PhD; Brenda J. Grossman, MD, MPH; Paul D. Mintz, MD; Barbara A. O'Malley, MD; Deborah A. Sesok-Pizzini, MD; Aryeh Shander, MD; Gary E. Stack, MD, PhD; Kathryn E. Webert, MD, MSc; Robert Weinstein, MD; Babu G. Welch, MD; Glenn J. Whitman, MD; Edward C. Wong, MD; and Aaron A.R. Tobian, MD, PhD

Financial Disclosures/Conflicts of Interest

Committee members had no substantial conflicts of interest as defined by the AABB conflict of interest policy. Pursuant to the policy, individual members were required to disclose actual and apparent financial, professional, or personal conflicts (see Appendix Table 1 in the original guideline document). Disclosures can be viewed at <https://www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M14-1589>

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Availability of Companion Documents

The following is available:

- Kumar A, Mhaskar R, Grossman BJ, Kaufman RM, Tobian AA, Kleinman S, Gernsheimer T, Timmuth AT, Djulbegovic B. Platelet transfusion: a systematic review of the clinical evidence. *Transfusion*. 2015;55:1116-27. Electronic copies: Available from the [Transfusion Journal Web site](#) .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on July 10, 2015. The information was verified by the guideline developer on September 22, 2015.

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